WHAT IS CLAIMED IS:

1. A method for measuring a physiological parameter, comprising:

measuring a plurality of signals, wherein each of said signals comprises a source component corresponding to said physiological parameter and an interference component;

processing said plurality of signals to obtain a plurality of principal components;

processing said plurality of principal components to obtain a plurality of independent components, wherein a matrix of said plurality of signals corresponds to a matrix product of a matrix of said plurality of independent components and a matrix of mixing coefficients; and

extracting a first measure of said physiological parameter corresponding to said source component from one of said plurality of independent components.

2. The method of claim 1 wherein said physiological parameter is a function of an oxygen saturation.

3. The method of claim 1 wherein said physiological parameter is a function of a pulse rate.

4. The method of claim 1 wherein said plurality of signals corresponds to sensed optical energies from a plurality of wavelengths.

5. The method of claim 1 wherein said plurality of signals corresponds to sensed optical energies from a plurality of wavelengths from different times.

6. The method of claim 1 wherein said processing said plurality of signals further comprises

obtaining a time derivative of the sensed optical energies from a plurality of wavelengths.

7. The method of claim 1 wherein said interference component comprises signal components caused by motion, respiratory artifact, ambient light, optical scattering and other interference between a tissue location being sensed and a sensor.

8. The method of claim 1 wherein said processing said plurality of signals further comprises decorrelating said plurality of signals by minimizing a cross-correlation of said plurality of signals, to obtain a plurality of decorrelated signals; and

normalizing said plurality of decorrelated signals to obtain a plurality of principal components.

9. The method of claim 1 wherein said processing said plurality of signals comprises decorrelating said plurality of signals by singular-value decomposition of said plurality of signals, to obtain a plurality of principal components.

10. The method of claim 1 wherein said processing said plurality of signals comprises decorrelating said plurality of signals by multiplying said plurality of signals by the inverse square root of the covariance matrix of said plurality of signals to obtain a plurality of principal components.

11. The method of claim 1 wherein said processing of said plurality of principal components comprises higher-order decorrelation of said plurality of principal components.

12. The method of claim 1 wherein said processing said plurality of principal components comprises maximizing a function of the higher-order cumulants of a mixture of said plurality of signals, thus separating said source component from said interference component.

13. The method of claim 12 wherein said higher-order cumulant is cumulant having order greater than two.

14. The method of claim 12 wherein said higher-order cumulant is a third-order cumulant of said plurality of signals.

15. The method of claim 12 wherein said higher-order cumulant is a fourth-order cumulant of said plurality of signals.

16. The method of claim 1 further comprising obtaining a ratio of mixing coefficients from said matrix of mixing coefficients, wherein said ratio corresponds to a ratio of modulation ratios of red to infrared signals, wherein said plurality of signals comprise modulated optical signal in the red and infrared ranges.

17. The method of claim 1 further comprising extracting a second measure of said physiological parameter from said ratio, wherein said second measure of said physiological parameter corresponds to an oxygen saturation.

18. The method of claim 1 wherein said first measure of a physiological parameter corresponds to a pulse rate.

19. The method of claim 1 further comprising extracting said interference component from another one of said plurality of independent components.

20. A pulse oximeter, comprising:

a sensor configured for measuring a plurality of signals, wherein each of said signals comprises a source component corresponding to said physiological parameter and an interference component;

a computer useable medium having computer readable code embodied therein for measuring a physiological parameter, said computer readable code configured to execute functions comprising:

processing said plurality of signals to obtain a plurality of principal components;

processing said plurality of principle components to obtain a plurality of independent components, wherein a matrix of said plurality of signals corresponds to a matrix product of a matrix of said plurality of independent components and a matrix of mixing coefficients; and

extracting a first measure of said physiological parameter corresponding to said source component from one of said plurality of independent components.

21. The pulse oximeter of claim 20 wherein said physiological parameter is an oxygen saturation.

22. The pulse oximeter of claim 20 wherein said physiological parameter is a pulse rate.

23. The pulse oximeter of claim 20 wherein said plurality of signals corresponds to sensed optical energies from a plurality of wavelengths.

24. The pulse oximeter of claim 20 wherein said plurality of signals corresponds to sensed optical energies from a plurality of wavelengths from different times.

25. The pulse oximeter of claim 20 wherein said plurality of signals corresponds to the time derivative of the sensed optical energies from a plurality of wavelengths.

26. The pulse oximeter of claim 20 wherein said interference component comprises signal components caused by motion, respiratory artifact, ambient light, optical scattering and other interference between a tissue location being sensed and a sensor.

27. The pulse oximeter of claim 20 wherein said processing said plurality of signals comprises decorrelating said plurality of signals by minimizing a cross-correlation of said plurality of signals, to obtain a plurality of decorrelated signals; and

normalizing said plurality of decorrelated signals to obtain a plurality of principal components.

28. The pulse oximeter of claim 20 wherein said processing said plurality of signals comprises decorrelating said plurality of signals by singular-value decomposition of said plurality of signals, to obtain a plurality of principal components.

29. The pulse oximeter of claim 20 wherein said processing said plurality of signals comprises decorrelating said plurality of signals by multiplying said plurality of signals by the inverse square root of the covariance matrix of said plurality of signals to obtain a plurality of principal components.

30. The pulse oximeter of claim 20 wherein said processing of said plurality of principal components comprises higher-order decorrelation of said plurality of principal components.

31. The pulse oximeter of claim 20 wherein said processing said plurality of principal components comprises maximizing a function of the higher-order cumulants of a mixture of said plurality of signals, thus separating said source component from said interference component.

32. The pulse oximeter of claim 31 wherein said higher-order cumulant is cumulant having order greater than two.

33. The pulse oximeter of claim 31 wherein said higher-order cumulant is a third-order cumulant of said plurality of signals.

34. The pulse oximeter of claim 31 wherein said higher-order cumulant is a fourth-order cumulant of said plurality of signals.

35. The pulse oximeter of claim 20 wherein said processing said plurality of principal components comprises successive transformations to simultaneously minimize second- and higher-order correlations among the outputs.

36. The pulse oximeter of claim 20 wherein said processing said plurality of principal components comprises successive rotations to minimize estimated mutual information among the outputs.

37. The pulse oximeter of claim 20 further comprising obtaining a ratio of mixing coefficients from said matrix of mixing coefficients, wherein said ratio corresponds to a ratio of modulation ratios of red to infrared signals.

38. The pulse oximeter of claim 20 further comprising extracting a second measure of said physiological parameter from said ratio, wherein said second measure of said physiological parameter corresponds to an oxygen saturation.

39. The pulse oximeter of claim 20 wherein said first measure of a physiological parameter corresponds a pulse rate.

40. The pulse oximeter of claim 20 further comprising extracting said interference component from another one of said plurality of independent components.